



National Energy
Board

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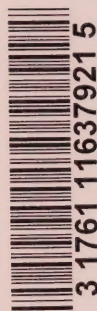
Reasons for Decision

**Cedars Rapids
Transmission Co.**

EH-1-2002

June 2002

Facilities



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National Energy Board

Reasons for Decision

In the Matter of

Cedars Rapids Transmission Co.

Application dated 20 July 2001, amended on
7 December 2001, for an International Power
Line

EH-1-2002

June 2002

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represented by the National Energy Board

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Abbreviations and Glossary

Act	<i>National Energy Board Act</i>
AN	audible noise
Board or NEB	National Energy Board
CEAA	<i>Canadian Environmental Assessment Act</i>
City Council	Representatives of the Council of the City of Cornwall
CPTAQ	<i>Commission de protection du territoire agricole du Québec</i>
CN	Canadian National
CRT or Applicant	Cedars Rapids Transmission Co.
CSA Standard	latest revision of Canadian Standards Association standard CAN/CSA-C22.3 no.1-M87 for Overhead Systems
Certificate	Certificate of Public Convenience and Necessity
Hz	hertz
IMO	Independent Electricity Market Operator of Ontario
IPL or line	international power line
ISO	Independent System Operator
km	kilometre(s)
kV	kilovolt(s)
kV/m	kilovolts per meter
m	metre(s)
μ T	microtesla
MAC	Mouvement au Courant
MH	Manitoba Hydro

MW	Megawatt(s)
NERC	North American Electric Reliability Council
NPCC	Northeast Power Coordinating Council
OPG	Ontario Power Generation Inc.
Régie	Régie Intermunicipale du canal de Soulanges who is also known as the Société de développement du canal Soulanges.
RI	radio interference
TVI	television interference
V/cm	volts per centimeter
Existing Line or Existing IPL	refers to CRT's original 72.8 km line built in 1913 for which a replacement is being proposed; the existing line has an operating voltage of 120 kV.
decongestion work	common term for projects that are aimed at removing transmission capacity constraints (see sections 1.2 and 2.4).
receiving area	a 1.3 km-wide area centred on CRT's right-of-way; also referred to as the local landscape.
Reconstructed Line or Reconstructed IPL	refers to CRT's proposed replacement of 71 km of its existing line; CRT has proposed the line be reconstructed according to a 230 kV standard (see sections 1.1 and 1.2), and be operated at the same voltage as the existing line, 120 kV.

Recital and Appearances

IN THE MATTER OF the *National Energy Board Act* (the Act) and the regulations made thereunder;
and

IN THE MATTER OF an application dated 20 July 2001, amended on 7 December 2001, by Cedars Rapids Transmission Co. (CRT) for a Certificate of Public Convenience and Necessity (Certificate) for the reconstruction and operation of an international power line and the dismantling of its existing line;
and

IN THE MATTER OF Hearing Order EH-1-2002 dated 11 January 2002;

HEARD in Dorval, Quebec on 26 and 27 March 2002;

BEFORE:

J.S. Bulger
J.-P. Théorêt
C.L. Dybwad

Presiding Member
Member
Member

APPEARANCES:

L.-A. Leclerc

Cedars Rapids Transmission Co.

D.M. Brown
C. Burrell

Independent Electricity Market Operator of Ontario

C. Beauchemin
C. Briand

National Energy Board

Chapter 1

Introduction

1.1 Background

On 20 July, 2001, Cedars Rapids Transmission Co. (CRT or the Applicant) applied to the National Energy Board (the Board), under Part III.1 of the *National Energy Board Act* (the Act), for a permit to reconstruct a section of its Existing International Power Line¹ (IPL or line) to a potential operating voltage of 230 kV, but to operate its Reconstructed Line² at 120 kV, and to dismantle the section of the line replaced by the Reconstructed Line. The original application proposed two options for approval. The first option provided for the Board's consideration of a total of 3.72 km of line for approval, while the second provided for the Board's continued jurisdiction for 72.8 km of line, the entire length of CRT's existing transmission line.

The Applicant also sought an order to revoke the existing Certificate of Public Convenience and Necessity (Certificate), EC-10, granted by the Board in 1959.

In response to the CRT's proposed two options, the Board, by letter dated 25 October 2001, decided it would continue to exercise its jurisdiction over the entire 72.8 km line and that CRT's second option would, therefore, be considered by the Board. Specifically, the Board would consider an application to:

- reconstruct 71 km of the Existing IPL to a 230 kV standard, from Les Cèdres generating station in Quebec, to a connecting point at the western perimeter of Cornwall in Ontario;
- operate an IPL of 72.8 km at 120 kV consisting of the 71 km Reconstructed Line and a 1.8 km section of the Existing Line. The entire 72.8 km line is from the Les Cèdres generating station in Quebec, to a point on the international border near Cornwall; and
- dismantle the 71 km section of Existing Line after the commissioning of the reconstructed section.

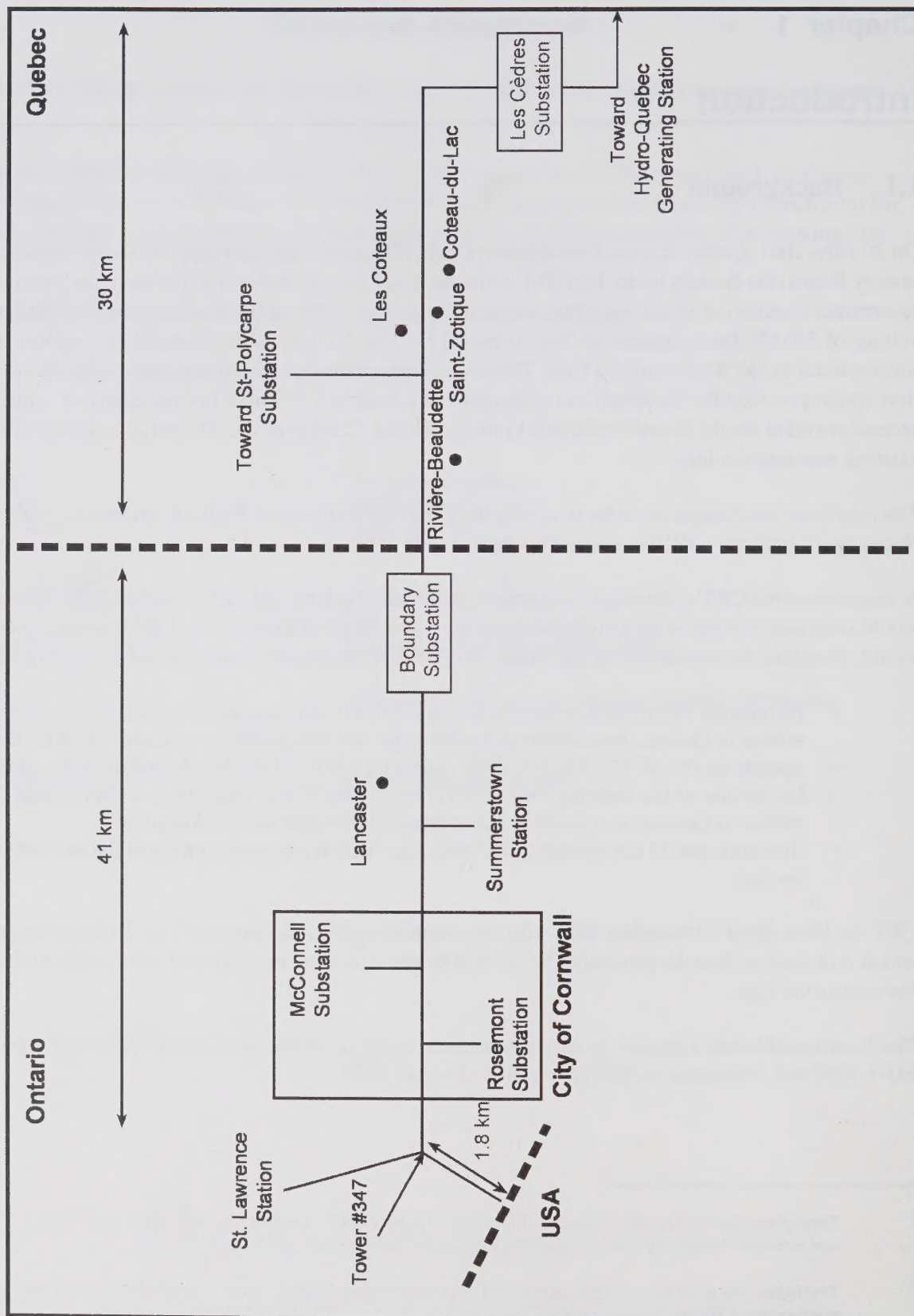
CRT, by letter dated 7 December 2001, filed an amended application pursuant to s. 58.23 of the Act, in which it elected to have the provisions prescribed by the Act, and not provincial laws, apply to the Reconstructed Line.

The Board established a process to assess the revised application and published its Hearing Order EH-1-2002 and Directions on Procedures on 11 January 2002.

¹ Throughout the text, the term "Existing IPL or Line" refers to CRT's original line built in 1913 for which a replacement is being proposed; the Existing Line has an operating voltage of 120 kV.

² Throughout the text, the term "Reconstructed IPL or Line" refers to CRT's proposed replacement of 71 km of its existing line; CRT has proposed the line be built according to a 230 kV standard, and be operated at the same voltage as the existing line, at the 120 kV standard.

**Figure 1-1
Map of CRT Line**



As a result of CRT's notice of application, three parties intervened. These parties were Mouvement Au Courant (MAC), the Independent Electricity Market Operator of Ontario (IMO), and Ontario Power Generation Inc.(OPG). MAC later withdrew its application for intervenor status, electing to submit a letter of comment instead.

Shortly before the hearing, CRT objected to certain information requests and asked the Board to rule on those objections. In an amended letter dated March 18, 2002, the Board gave its ruling and provided reasons for its decisions regarding CRT's objections. The effect of the Board's ruling in the aforementioned letter was to circumscribe the issues the Board should consider, eliminating those which, in the Board's view, were not sufficiently linked to the subject of CRT's application before the Board. It was further decided that tariff matters were not relevant to the consideration of an application for a certificate of public convenience made under Part III.1 of the Act which deals with the construction and operation of international power lines. The Board also indicated that it would allow questions on the effects of the Reconstructed Line on provinces other than those through which the line is to pass, but such submissions should be limited to the effects of the Reconstructed Line operating at 120 kV. The Board decided that consideration of the effects of the Reconstructed Line operated at 230 kV was not relevant to the application because CRT was only seeking the Board's approval to operate the line at 120 kV. Lastly, the Board offered some clarification of the concept of fair market access, explaining that this principle has to do with exports and access to electricity.

Letters of comment were received from MAC, representatives from the City of Cornwall Council (City Council) and the Cornwall Regional Airport Commission.

The Board held an oral public hearing to consider CRT's revised application in Dorval, Quebec on 26 and 27 March 2002, at which, in addition to the Applicant, the IMO registered an appearance.

1.2 Project Description

CRT owns and operates a 120 kV double circuit international power line that was built in 1913. The line extends over a distance of 72.8 km from Les Cèdres generating station in Quebec to a point on the international boundary near the Cornwall, Ontario (Figure 1-1). Since 1959, the line has been regulated by the Board as an international power line under Certificate EC-10. CRT stated the line has reached the end of its useful life and, considering the increasing risks associated with its age, should be repaired or reconstructed.

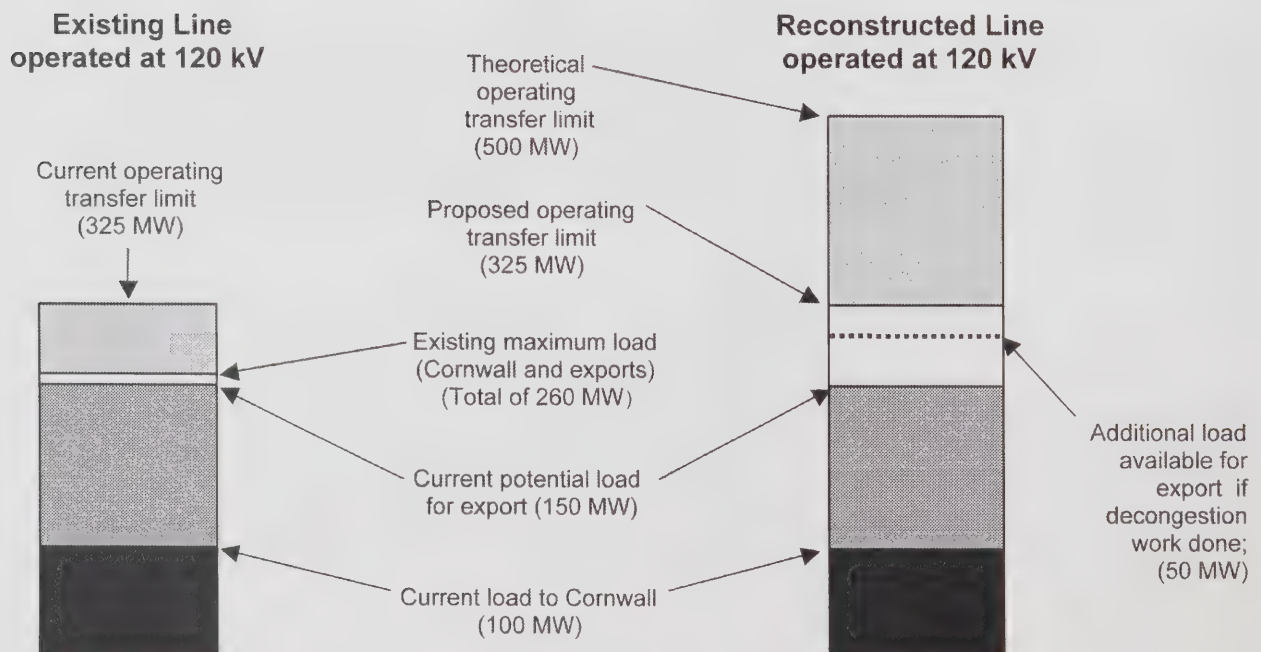
The CRT line has been used to serve both domestic and export electricity markets. It is the only source of electric supply to Cornwall although, in an emergency situation, Cornwall can be fed from the U.S. side. CRT stated that the power supplied to Cornwall has averaged 100 MW in recent years while exports to the U.S. have been limited to a maximum of about 150 MW because of system stability and transmission capacity constraints in the U.S. CRT also stated that the export capability could be increased by about 50 MW if certain small projects to relieve congestion (i.e. decongestion work) in the U.S. were implemented, bringing the total export capability to 200 MW. The Existing Line has a total transfer capability of 325 MW but the actual maximum power transmitted has not exceeded about 260 MW (see Figure 1-2).

CRT applied to reconstruct a 71 km section of its Existing IPL to a 230 kV standard on the same right-of-way as its Existing Line, at a cost of \$ 40 million. The last 1.8 km of the line, from tower #347 to the international border, was rebuilt in 1958 to the 230 kV standard. In order to ensure continued service during reconstruction, CRT proposed to dismantle the Existing Line after the commissioning of the reconstructed section. CRT planned to reconstruct the line in the latter part of 2003 and to dismantle the Existing Line in the winter of 2003/2004.

The Reconstructed Line would consist of two circuits with a voltage capability of 230 kV. A total of 244 230-kV double-circuit lattice towers would be installed. Reduced-based towers will be used primarily (80% of total). Reduced-based towers, which take up less space on the ground, are block-foundation towers that are erected over a single caisson pile foundation. The other towers that would be installed are anti-cascading, angle-anchor, and crossing towers (20% of total). These are all rigid towers, with four feet, that are built on four grillage or pile foundations. Angle-anchor towers are used at route angles greater than five degrees. Crossing towers would be employed for crossing the Soulanges Canal, Highway 20 and other electrical transmission lines. The average span between all towers would be approximately 300 m.

Most of the above-listed towers are double-circuit structures. However, convertible double-circuit structures, which have a different design, will be used for 8.8 km of the route within the Cornwall area. Convertible double-circuit towers are capable of accommodating two additional circuits (one on each side), in addition to the two circuits present.

Figure 1-2
CRT Load & Transfer Limit Comparison
(Existing vs. Reconstructed)



While CRT proposed to reconstruct the Existing Line to the 230 kV standard, at this time, CRT only sought approval to operate the Reconstructed Line at 120 kV. The existing transfer limit of 325 MW will also be maintained. The Reconstructed Line will have a theoretical transfer limit of 500 MW at 120 kV.

1.3 Environmental Screening Process

In accordance with section 18 of the *Canadian Environmental Assessment Act* (CEAA), the Board conducted an environmental screening to assess the project's impact on the environment. CRT submitted an environmental assessment describing the environmental effects that could result from the construction and operation of the Reconstructed Line, and the dismantling of the Existing Line. Environmental effects (including the effects of malfunctions or accidents, cumulative effects and the effects of the environment on the project), specific mitigation measures, and likely residual effects were examined based on CRT's environmental assessment and subsequent submissions, responses to information requests, as well as comments received throughout the proceeding from the public and government agencies, and on evidence presented during the Board's hearing process.

The Board ensured that there was no duplication in the requirements under the CEAA and the Board's own regulatory process. Results of the screening process are presented in Chapter 4.

Chapter 2

Construction and Operation of the Reconstructed Line

2.1 Justification of the Reconstructed Line

CRT indicated that the applied-for project was justified for a number of reasons that fall within two categories: the justification for the reconstruction of the Existing Line, and the justification for the reconstruction of the line to a 230 kV standard.

Justification for the Reconstruction of the Existing Line

CRT stated that the need to replace the Existing Line is based on issues of reliability of service and physical integrity, including safety. The Existing Line was built in 1913 and has since served export and domestic markets. The line constitutes the only regular supply source of electricity to Cornwall. Almost all of the facility's components remain original. CRT indicated that these components, such as towers and conductors, are showing signs of wear from almost a century of use, including the stress resulting from the ice storm of 1998. CRT stated that, in general, power lines are replaced after 60 years.

CRT submitted that the alternative solution of rehabilitating the Existing Line by replacing failing components, such as corroding towers or deteriorating foundations, would require an interruption to service to Cornwall, since the design of the Existing Line does not allow for maintenance while the line is energized. Such an alternative would be costly, would cause major inconveniences to Cornwall and would only defer the replacement of the line by a few years. CRT rejected this alternative for these reasons. CRT submitted that the risk of a major malfunction of the Existing Line increases with each day that passes and that the reconstruction of the Existing Line would address CRT's concern of physical integrity, and safety, of its current facilities.

CRT noted in argument that no party present at the hearing contested the justification of the reconstruction of the Existing Line.

The IMO stated it was not opposed to CRT's application and that it is a strong proponent of enhanced transmission facilities throughout the North American grid.

MAC, in its letter of comment dated 22 March 2002, submitted that the need for the project was not established for various reasons, including: Cornwall's electricity demand can be met by the Existing Line; CRT has given no indication as to when it would increase the voltage of the Reconstructed Line; the Existing Line appears to be in excellent condition (no sign of rust, withstood ice storm of 1998, no engineering report on condition of line); the New York transmission grid constraints preclude a significant increase in exports, and; the reconstruction and dismantling activities would cause negative environmental impacts. MAC also questioned the cost of the project as it related to any associated tariff implications.

Justification for the Reconstruction to a 230 kV Standard

In support of the increase in voltage capability of the Reconstructed Line, CRT submitted that this increase was a good long-term strategy considering the potential life of the Reconstructed Line. CRT stated that it foresees the demand of Cornwall to be such that an eventual operating voltage of 230 kV could be required. CRT submitted that investing an extra ten percent for reconstruction of the line to a 230 kV standard instead of 120 kV at this time would be cost efficient. CRT also submitted that it is currently a common practice for transmission line companies to build new lines at higher operating voltages.

Further points raised by CRT to justify the construction of the line included: the limited environmental impact of a one-time construction; the reduced number of towers required to support the Reconstructed Line (from 346 to 244 towers), and; the larger conductor size which will be similar to those used by its parent company, Hydro-Quebec, and therefore would facilitate common maintenance operations, tooling and personnel training.

CRT also submitted that the Reconstructed Line would allow for increased supply security for two reasons. First, due to its configuration, the Reconstructed Line would allow CRT to conduct maintenance on the line while it remained energized. This is not the case with the Existing Line. Second, in the case that one of the two circuits on the Reconstructed Line were de-energized, the remaining circuit would have sufficient capacity (250 MW, which is half of the total capacity of 500 MW) to meet the supply needs of Cornwall (100 MW) and exports (up to 150 MW). CRT considered this would contribute to a higher quality of service to Cornwall and export customers.

No party present at the hearing argued against the justification of reconstructing the line to a 230 kV standard, however, there were questions and submissions made by the IMO on the Reconstructed Line operating at 120 kV and the associated impacts on the reliability of its interconnections. The IMO also pursued questions regarding the design of the Reconstructed Line and the related issue of open access. Further, the IMO submitted that the Board should consider imposing on CRT some conditions in the public interest relating to its concerns (see section 2.4 for more detail on the conditions proposed by the IMO).

Views of the Board

The Board notes that the Existing Line is almost 90 years old and accepts CRT's evidence that it should be replaced. No party to the hearing produced evidence that challenged the need for the Existing Line to be replaced. The Board is satisfied that reconstructing the line to a 230 kV standard is more efficient over the long term from an environmental perspective, due to the one-time construction window. The Board also accepts CRT's evidence that the reconstruction is more efficient from an economic perspective, due to the minimal increase in project costs (10 percent). The Board is of the view that the proposed reconstruction of the Existing IPL will enhance system integrity and operational safety, and elevate public safety to a level that is consistent with new facilities. As the operation of the Reconstructed Line will continue to be at 120 kV, it should provide an improved quality of service through greater reliability and reduced service interruption.

The Board notes that before CRT can operate the Reconstructed Line at a voltage greater than 120 kV, it must make an application to the Board. At that time, parties who may have concerns with the effects of a greater operating voltage will have the opportunity to participate in the Board's proceeding. Therefore, the Board is of the view that the reconstruction of the line to a 230 kV standard and its operation at 120 kV, as proposed by CRT, is justified.

The potential environmental impacts of the Reconstructed Line and the dismantling of the Existing Line are provided in detail in the Board's Environmental Screening Report. Finally, as previously noted in section 1.1, in its letter of 18 March 2002, the Board stated that tariff matters were not relevant to an application under Part III.1 of the Act.

2.2 The Appropriateness of the Design of the Reconstructed Line

CRT stated that its Reconstructed Line will be designed in conformance with all applicable standards that were identified in its evidence, including the latest revision of the Canadian Standards Association standard CAN/CSA-C22.3 no.1-M87 for Overhead Systems (CSA Standard), as well as those referred to by the Board in its information requests and during cross-examination. CRT's conceptual design envisages the current operation requirements of the IPL as well as the eventual operation at 230 kV.

The Reconstructed IPL would be supported on steel double circuit lattice towers of which 8.8 km within Cornwall city limits would be designed to support additional 120 kV circuits if the operating voltage of the Reconstructed Line were, subject to Board approval, increased to 230 kV. Of the 244 towers to be constructed, the majority (80 percent) would be of a reduced base type and the remainder would either be anti-cascading, angle-anchor or crossing types. The average span between towers would be about 300 m while the height would range from a minimum of 30.5 m to a maximum of 70 m. The design of these towers would allow workers to perform maintenance while the Reconstructed Line remained energized.

CRT stated that the tower and foundation design would be based on the loading cases and factors of safety used by its parent company, Hydro-Quebec, which were revised in 2000 as a result of the 1998 ice storm. The combined maximum ice loading and wind appropriate to the area would also be included in the loading cases considered.

CRT enumerated the following advantages in support of its proposed design for the Reconstructed Line: the size of conductors corresponds to Hydro-Quebec's standards which allows for efficiency gains in tooling and equipment, and training; the longer spans between towers reduces the number of towers required and associated environmental impacts; the reduced tower bases increase the area available for cultivation; the Reconstructed Line would enhance the capability of the IPL to supply Cornwall and exports by a single circuit, and; CRT's design enhances the ability to perform maintenance on one circuit while the other circuit remains energized.

Detail regarding some of the technical features of CRT's proposed design can be found in Section 2.3.

Views of the Board

The Board is of the view that CRT has adequately considered design options for the reconstruction of the Existing IPL. The Board notes that the general concept of replacing the existing 120 kV IPL with a line designed to a 230 kV standard and continuing operation of the Reconstructed Line at 120 kV, has not been questioned on technical grounds. The Board is satisfied with the evidence provided on the tower, conductor and circuit design and that the proposed design is appropriate. The Board expects that CRT's Reconstructed IPL will be built and operated in accordance with the CSA Standard as well as the latest design criteria appropriate to its geographic location.

2.3 The Safety of the Design and Operation of the Reconstructed Line

2.3.1 Public and Worker Safety

CRT identified several aspects relating to safety of the public and construction workers during the periods of reconstruction and dismantling of the lines and proposed measures to mitigate safety concerns.

CRT's application identified a number of recreational and resort areas within its receiving area which include: a skeet shooting range in Les Cedres; an outdoor centre in Coteau-du-Lac; a golf course in Riviere Beaudette; a driving range in Cornwall; a cross-country ski center in Lancaster; a canoe route on the Raisin River, and; a tourist information centre on Highway 401. Also, there are three campgrounds in Coteau-du-Lac and one in Glengarry Provincial Park. Hunting occurs in several forests north of Highway 401 between Lancaster and Summerstown Station. In terms of trails and pathways, the 27 km Soulanges Canal bicycle path connects Pointe-des-Cascades to Saint-Zotique, and there are numerous local snowmobile trails. In addition, the City of Cornwall maintains a bicycle path along the CRT right-of-way and local snowmobile clubs also use portions of the CRT right-of-way in the winter.

Mitigation measures proposed by CRT to address public safety included the following: the posting of warnings of construction and dismantling activities on recreational (including snowmobile) paths/tracks; the positioning of surveillance personnel at the work site during conductor stringing and removal; the closure of recreational paths/tracks as necessary; the provision of weekly patrols to ensure that signs and barriers are in order; informing responsible authorities for the shooting range of planned activities, and; ensuring no hunting occurs in the area of construction or dismantling work. To make access to towers by the public more difficult, CRT will try to place certain towers as far away as possible from public roads and pathways. CRT also stated it will try to schedule all construction activities near schools during the summer holidays, but, if this were not possible, CRT will keep schools informed of the construction schedule and would ensure safety in accordance with the applicable laws and regulations. Furthermore, CRT committed to providing landowners and recreational facilities located near its right-of-way with adequate notice of its construction schedule.

With respect to worker safety, CRT committed to filing its construction safety manual with the Board 60 days before construction begins. In addition to the safety manual, CRT also agreed to file the contractor's training program on current guidelines and standards.

The receiving area contains several transport and communications infrastructure facilities, including: an oil pipeline; gas pipeline; Highway 20 / 401; local roadways; a Canadian National (CN) railway line; an abandoned Canadian Pacific railway line; three electrical transmission corridors; four microwave communications towers, and; municipal services infrastructures. CRT stated that it will present its construction plans, for information or approval, to third party owners and operators of the utilities that will be crossed by the new IPL.

Views of the Board

Public and worker safety and the integrity of other utilities depend on many factors including facility design, material selection, construction and inspection practices and operating and maintenance practices. As such, the Board has imposed conditions 12, 14, 16 and 17 on CRT relating to these matters (see Appendix 1).

With respect to inspection, the Board notes that CRT is required to comply with the CSA Standard. The Board also notes that, as provided by condition 18, the Applicant will be required to inspect the Reconstructed Line during its construction and file with the Board a confirmation, by an officer of CRT, that the approved facilities were completed and constructed in compliance with all applicable conditions.

On the basis of the foregoing, the Board is satisfied that the Reconstructed Line would meet accepted standards and the Board's own requirements regarding construction, operation and maintenance.

The Board is also satisfied that CRT is committed to safety of the public and construction workers during the construction and dismantling periods. The Board expects CRT to implement all identified mitigative measures so as to ensure maximum public and worker safety during the construction and dismantling periods.

2.3.2 Electric and Magnetic Fields

The presence of electric and magnetic fields are a concern to those who work or reside in the vicinity of electric power transmission lines. At meetings with municipal/local representatives (including City Council, Administration of Notre-Dame School in Cornwall, and the Health Office of Eastern Ontario), CRT provided information on electric and magnetic fields and stated that the magnetic fields generated by the Reconstructed IPL would be lower at the edge of the right-of-way than with the Existing IPL. Regarding this matter, the City Council stated it was its understanding that moving the Reconstructed IPL closer to the center of the right-of-way, and changing the style/height and configuration of the towers, will have the effect of reducing magnetic field levels. City Council asked the Board to ensure that the safeguards proposed by CRT would be undertaken.

Electric Fields

CRT presented evidence that an electric field is produced by voltage and is measured in volts per centimeter (V/cm) or in kilovolts per meter (kV/m). An electric field attenuates rapidly with distance, and is significantly reduced by conducting objects or physical barriers in the vicinity, such as trees, fences, walls, etc. Because CRT stated the conductors of the Reconstructed IPL are larger in diameter and

generally further from the ground than those of the Existing Line, therefore, the electric field strength in the right-of-way will be lower than that of the Existing Line when the Reconstructed IPL is operated at 120 kV.

Magnetic Fields

Regarding the magnetic fields, CRT stated they are produced by the current in the conductors and measured in microtesla (μT). A magnetic field also attenuates rapidly with distance; however, it is not significantly reduced by physical barriers but is affected by any other current-carrying conductors in the vicinity. CRT provided calculated values of magnetic field strength for both the Existing and Reconstructed IPLs under various loading conditions and for certain locations, including the vicinity where a school abuts its right-of-way. The data showed that the calculated magnetic field strength at the edge of the right-of-way of the Existing IPL does not exceed $4.9 \mu\text{T}$ at a transmitted power of 250 MW with both circuits in operation and that, at the same power level, the corresponding value for the Reconstructed IPL within the Cornwall city limits would be $1.9 \mu\text{T}$. It was also calculated that, for the Existing IPL, the magnetic field strength at the edge of the right-of-way could increase to $6.4 \mu\text{T}$ when operated at its maximum power level.

CRT pointed out that neither Canada nor Quebec have set standards for magnetic field exposure limits, despite federal and provincial health departments having examined the issue. In the absence of Canadian government standards, CRT presented guidelines proposed by other organizations that put magnetic field levels into perspective. CRT noted that the most restrictive internationally recognized recommendation for exposure to magnetic fields (by the International Commission on Non-Ionizing Radiation Protection in 1998) suggest a limit of $83 \mu\text{T}$ for operation at 60 Hz for the public at large. This is the lowest recommendation so far, although other organizations have recommendations that allow for higher exposure limits. In contrast, ambient magnetic fields in North American homes are generally in the order of $0.15 \mu\text{T}$.

Views of the Board

The Board is of the opinion that the electric field strength at the edge of the right-of-way will be negligible when the Reconstructed IPL is operated at 120 kV and would generally be lower than that of the Existing Line. The Board is satisfied with CRT's assurances that the magnetic field will be lower than that of the Existing IPL and that any magnetic field resulting from the operation of the Reconstructed Line at 120 kV would not reach levels which could be considered to be harmful to the public health.

The Board expects CRT to fulfill its commitments with respect to the electric and magnetic levels and, in particular, that CRT will operate the Reconstructed Line in such a way so as to ensure electric and magnetic fields related to the Reconstructed IPL will generally not be greater than those of the Existing IPL.

2.3.3 Effects on CN Railway

There were two issues identified that could affect the integrity of the CN railway.

Proximity of the Reconstructed Line to the CN Railway

CRT's right-of-way runs parallel and in close proximity to the CN railway for approximately 28.5 km between Les Coteaux, Québec and Summerstown, Ontario. CRT stated that the center line of the towers of the Reconstructed IPL would be about 16.5 m from the closest rail of CN. With the proposed reconstruction of the IPL between the Existing Line and the railway, there is the potential for the Reconstructed IPL to obstruct the railway, should any of its towers fall. This condition is referred to as "proximity" in the CSA Standard.

CRT confirmed that a total of 90 towers would, if they were to fall, be capable of interfering with the operation of the railway. CRT was questioned as to whether it had considered the construction of the Reconstructed Line immediately to the north of the Existing IPL instead of adjacent to the railway to the south of the Existing IPL. CRT replied that construction to the north of the Existing Line would be outside its right-of-way and could present additional problems, such as landowner-related concerns. To address the potential risk associated with its proximity to CN's railway, CRT confirmed that the towers alongside the railway would meet or exceed the requirements of Grade 1 construction³ of the CSA Standard. CRT submitted that with Grade 1 construction, relocation was not required.

Possible Interference with Railway Signal Systems

CRT undertook to perform a study of the potential effects of induction and interference from its Reconstructed Line on railway signaling and/or communication systems during the summer of 2002 and, agreed to provide written confirmation from CN that the reconstruction would cause no interference with railway signal systems.

Finally, CRT stated it would coordinate its reconstruction activities with CN.

Views of the Board

While recognizing the potential risks associated with the towers in close proximity to the railway, the Board is of the opinion that this risk has been minimized given CRT's commitment to Grade 1 construction of those towers at risk. CRT will comply with the latest revision of the Canadian Standard in force at the time of construction of the Reconstructed Line. Based on the foregoing, the Board is satisfied that public safety will not be jeopardized and, therefore, does not see the need to impose any additional measures beyond those provided in the CSA Standard.

³ CSA standard C22.3 No 1-M87 includes 3 construction grades. Grade 1 is the highest and Grade 3 the lowest. Grade 1 requires a higher safety factor between the applied forces on the IPL and the strength of the materials. Regarding materials, Grade 1 requires greater strength of hardware components e.g. insulators, conductors, towers. Overall, Grade 1 construction provides for a greater margin of safety when compared with Grades 2 and 3 construction.

CRT must file with the Board a copy of a letter from CN confirming that the above study regarding induction and interference has been completed and that CN is satisfied that its concerns have been adequately addressed before the Reconstructed IPL is energized, in accordance with condition 13 in Appendix 1.

2.3.4 Clearance between the Existing Line and Reconstructed Line

CRT stated that its right-of-way has a width of 38.1 m and that the Existing IPL towers are nominally centered 9.14 m from the northern edge of the right-of-way. The 28.96 m between the Existing IPL and the southern edge of the right of way is, according to CRT, sufficient to allow installation of the Reconstructed IPL on the same right of way. CRT proposed to center the towers of the Reconstructed IPL 16.16 m to the south of the Existing IPL; however this will be reduced to 12.12 m in Cornwall in order to permit the installation of two additional 120 kV circuits on the new towers, should these become necessary.

Evidence presented at the hearing indicated that the construction or dismantling of a transmission line in close proximity to another transmission line operating at high voltage presents a physical danger to construction workers. Also, the reliability of the transmission lines in normal operation may be compromised unless sufficient physical separations are maintained under all expected conditions.

CRT stated that the detailed design, including tower dimensions, conductor sag and swing, and spans of the Existing and Reconstructed IPLs and their positioning has not yet been completed. Nevertheless, CRT stated that the requirements of the CSA Standard will be respected. Where the IPLs are only 12.12 m apart from each other, erection of the Reconstructed IPL and dismantling of the Existing IPL will be carried out with the circuit adjacent to construction or dismantling activity being out of service.

Views of the Board

The Board notes that the detailed tower design has not been completed. The Board expects, based on CRT's assurances, that the final design will respect the CSA Standard and that worker safety and line reliability will be ensured.

2.3.5 Other Safety and Operating Issues

Concerns were raised during the hearing process regarding tower heights in the neighbourhood of the Cornwall Regional Airport, audible noise (AN), radio and television interference (RI and TVI), cathodic protection and clearances at the Soulanges Canal.

The Cornwall Regional Airport Commission was concerned about the height of up to eight towers of the Reconstructed IPL and their potential impact on airport safety. CRT, following meetings with the Airport Commission and Transport Canada representatives, agreed to limit the tower heights in the vicinity of the airport to comply with federal requirements. This entailed maintaining a 1:40 angle clearance for any structure in the runway flight path.

Regarding AN, RI and TVI, CRT noted they are due to partial electric discharges (also known as corona effects) from the surface of conductors or other hardware when operated at high voltage. CRT stated the conductors of the Reconstructed IPL will be of larger diameter than those of the Existing IPL. Therefore,

surface voltage gradients, when operated at 120 kV, will be reduced. Additionally, AN, RI and TVI levels will also be reduced relative to those of the Existing IPL.

Since the towers of the Reconstructed Line will be taller than those of the Existing IPL there is a possibility that they could have a negative impact on the broadcast pattern of radio antennas in the area of the Reconstructed Line. CRT pointed out that, in the event of interference at a particular frequency, the towers can be de-tuned to minimize the interference at the broadcast frequency of the antenna and that this technique has been applied with success by Hydro-Quebec.

Regarding cathodic protection, the CSA Standard requires a special study of the possible effect of existing cathodic protection systems on transmission line structures, guys, and other material. Trans-Northern Pipelines Inc. (TNPI) is the only known infrastructure with a cathodic protection system in proximity to CRT's line. TNPI has advised that it had deactivated the rectifiers on its cathodic protection system⁴ within Cornwall in June 2001 and therefore the study called for in the above standard was not required.

CRT stated that the two towers supporting the Reconstructed IPL at the crossing of the Soulanges Canal will be approximately 70 m tall. At the request of the Régie Intermunicipale du canal de Soulanges (the Régie), CRT committed to installing these pylons so that for the conductors provide a vertical clearance of about 37-38 m where the line crosses over the Soulanges Canal. This measure will allow the Canal to accommodate boats with masts of up to 35.5 m in height, based on the standard for the St. Lawrence seaway, and still provide an additional safety margin for electrical arcs.

Views of the Board

The Board is satisfied with the commitments made by CRT that the tower locations and heights in the vicinity of the regional airport will be chosen to avoid interference with airport's approach slope.

The Board believes that, with the Reconstructed Line operated at 120 kV, audible noise, radio and television interference are likely to be lower than with the Existing Line. Furthermore, the Board is satisfied, in the unlikely event of a negative impact on antennas in the neighborhood of the Reconstructed IPL, that straightforward and easily installed solutions are available to CRT to redress the situation.

The Board is satisfied there will be no interference with the cathodic protection of TNPI.

The Board notes that the Régie was in agreement with the proposed clearances. The Board is satisfied that the height of the new transmission towers at the Soulanges Canal crossing ensures that the conductors of the Reconstructed IPL will not interfere with the proposed operation of the canal by the Régie.

⁴ Cathodic protection, through the use of rectifiers, is used as a corrosion control measure on pipelines such as TNPI. TNPI's system continues to be cathodically protected but the rectifiers used are sufficiently far away to not experience interference from, nor create interference for, the CRT line.

2.4 Impact of the Reconstructed Line on Neighbouring Systems

The IMO stated it does not oppose CRT's reconstruction project and argued CRT's main intent was to increase the future export capacity to New York State. The IMO was concerned that:

- the operation of the Reconstructed IPL could indirectly affect the IMO-controlled transmission system, in particular the IMO phase shifting transformers, and have an impact on the transfer capability of the IMO controlled system;
- the design of the Reconstructed IPL might preclude or limit the ability of potential generators or loads to interconnect with CRT;
- CRT has made no application to the New York Independent System Operator (ISO) for consideration of a system impact study; and
- there could be technical obstacles to the design of the Reconstructed Line which would prevent a new generator from interconnecting with the Reconstructed Line.

The IMO requested the Board impose conditions regarding its concerns in any Certificate issued to CRT. The proposed conditions are that:

- 1) CRT adhere to good utility operating principles to ensure that new facilities do not reduce transfer capabilities of existing facilities;
- 2) existing Ontario transfer limits, and tie-lines to neighbouring jurisdictions are maintained;
- 3) an industry working group be established for the appropriate analysis of the impact of the proposed reconstruction and operation on the integrated power system;
- 4) studies be conducted to assess reliability, security and safety impacts of the Reconstructed IPL on the integrated power system; and
- 5) CRT ensures, on a best efforts basis, access to the Reconstructed IPL for Ontario parties.

CRT's comments regarding the proposed Certificate conditions are described below.

Good Utility Operating Principles

CRT argued that the IMO's concept of "good utility operating principles that new facilities must not reduce the transfer capability" of existing facilities was unclear, had not been defined during the hearing and, was beyond CRT's control. Accordingly, CRT was of the view that such a condition was unacceptable.

Transfer Limits and Maintenance of Tie-lines

CRT noted the IMO's reference to transfer limits and the maintenance of tie-lines in a previous Board decision regarding an international power line application by Manitoba Hydro (MH) and, the inclusion of a condition regarding this matter in the permit issued to MH ⁵.

CRT submitted there was a fundamental difference between its project and that of MH. MH's new IPL would add new transmission capacity to the interconnected system, unlike CRT's project, which would not, because current operating conditions would be maintained. Furthermore, CRT argued there was no evidence presented during its hearing demonstrating that its project would have a negative impact on the IMO-controlled system, which is not connected to the CRT line.

For the reasons described, CRT was of the view that a condition regarding this matter was not relevant to its application.

Industry Working Group Analysis of Reconstruction and Integrated Operation

The IMO stated that, adjacent to CRT's line to New York State, there is an IPL interconnection owned by Hydro One Networks, the St. Lawrence phase shifters. The IMO submitted there had been no direct discussions between CRT and Hydro One Networks about the impact of CRT's proposed Reconstructed Line on the St-Lawrence phase shifters transfer capability, nor had CRT made an application to the New York ISO for consideration of a system reliability impact study. The IMO stated it was incumbent upon the proponent of any facility to make the appropriate overtures to the relevant control area or regulating authority, the New York ISO in this case, to determine whether CRT should go through an appropriate system impact study.

CRT was of the view that a condition requiring a system impact study was unacceptable because there are existing processes under the North American Electric Reliability Council (NERC), through its regional affiliates, the Northeast Power Coordinating Council (NPCC) and the New York ISO, to ensure that such studies, if required, would be undertaken. CRT argued there was no evidence suggesting there would be an impact and opined there would be no impact on the IMO-controlled system under current operating conditions. CRT stated the New York ISO would be the only entity that would be in the position to reach such a conclusion since the New York ISO undertakes impact studies when there are requests to bring new loads into its system. CRT stated it would follow those procedures, as required.

Reliability, Security and Safety Impact Studies

CRT stated that congestion in the American transmission system limits exports by CRT to 150 MW. However, if some decongestion work were to be implemented, it might be possible for CRT to increase its exports from a maximum of 150 MW to about 200 MW. CRT also stated it could not provide a

⁵ Condition 10 of the Board's permit to MH states that MH "... shall construct and operate the proposed international power line in such a way as to maintain the existing transfer limits on Ontario's transmission system and interties, as required by the proposed 28 February 2002 Manitoba-Ontario Operating Guide". A copy of the Board's full decision dated 28 February 2002 related to MH can be obtained by either calling the Board at 1-800-899-1265 or accessing its website at www.neb-one.gc.ca.

precise evaluation of the possible impact of the changes in the characteristics of its IPL on the phase shifting transformers, principally, because CRT's line is not connected directly to the system operated by the IMO. CRT confirmed it cannot increase its export level until the American system is modified, hence there could be no impact on the IMO-controlled transmission system. Increases in export capability greater than 50 MW would require relatively major modifications to the American system.

CRT stated that while its IPL is connected to the Dennison substation of the Niagara Mohawk Power Corporation, this substation is not considered part of the "bulk" network by the New York ISO, and that Dennison is controlled by Niagara Mohawk.

CRT stated that its Existing IPL has a power transfer capacity of 325 MW and that, in the past two years, the actual load had averaged between 150 MW and 200 MW and had probably not exceeded 260 MW. CRT also stated that the Reconstructed Line would have a theoretical capacity of 500 MW when operated at 120 kV, but stressed that it wished to maintain the actual transfer limit of 325 MW. CRT submitted that since it is not proposing to change the voltage or the maximum power transmitted to the United States, there would be no change to line characteristics and, therefore, CRT would have no need to perform a system impact study on the effects of the Reconstructed Line on the interconnected systems.

With respect to a possible 50 MW increase in export capability, should the necessary decongestion work in the United States be effected, CRT noted that the maximum power would remain within the existing 325 MW limit and, since this level of power transfer had already been studied and approved, CRT did not see any problem. However, CRT agreed that if the export power limit were raised, it would be necessary to verify whether impact studies are required and, if so, CRT would participate in the studies, as required.

Concerning the possible impact of CRT's Reconstructed Line on the transfer capability of the IMO-controlled IPL from the St. Lawrence substation, in Ontario, to the Moses substation in New York, CRT stated it had not seriously addressed the impact on the St. Lawrence phase shifting transformers. CRT did not consider the question to be pertinent since no evidence had been presented that the Reconstructed IPL would have any effect on the phase shifting transformers at the St. Lawrence substation.

CRT asserted that additional system impact studies were not justified because operations could continue under the current operating conditions for the next ten years without a new system impact study being required by the New York ISO. Furthermore, CRT was not proposing to operate the Reconstructed IPL any differently. CRT noted that no evidence had been presented to show that there would be any impact on the IMO-controlled network.

Access by Ontario Parties to the Reconstructed IPL

It was the IMO's understanding that if a proposed generator were able to meet the technical standards for interconnecting with CRT's Reconstructed Line, there would be no technical obstacle preventing the new generator from interconnecting with the Reconstructed IPL.

CRT responded that it was simply a question of engineering and reliability impact studies to show there would be no problems with a proposed interconnection. Furthermore, CRT found it unacceptable to give

Ontarians preferential access to its IPL since CRT viewed the line as being open to any potential customer so long as the appropriate technical interconnection rules are followed.

Views of the Board

Regarding the adherence to good utility operating principals, the Board is of the view that CRT, through the NPCC membership of its parent company, Hydro-Quebec, will adhere to good utility operating principles.

Concerning the IMO request that existing Ontario transfer limits, and tie-lines to neighbouring systems be maintained, the Board notes that CRT is required to continue to operate its Reconstructed IPL at 120 kV and has committed to not exceed the current operating transmission limit of 325 MW. Therefore, the Board believes there will not be any adverse impact on the transfer capability of existing facilities. Accordingly, the Board does not see the need to impose a condition that CRT be required to operate its Reconstructed IPL in a way that ensures the existing transfer limits are maintained.

With respect to the establishment of an industry working group and attendant studies assessing reliability, security and safety impacts of the Reconstructed IPL on the integrated power system, the Board notes that CRT does not plan to increase the power transmitted beyond the established capability of the Existing IPL because the Applicant is constrained to maintaining the current power levels due to existing congestion within the New York system. Therefore, the Board considers it unlikely there will be any adverse impact on neighbouring systems.

The Board cannot comment on the necessity of new system impact studies, which is a determination for the appropriate reliability authorities to make. Should CRT wish to increase the level of power transmitted, the Board notes that in such an event, if system impact studies would be required by the New York ISO or NPCC, CRT has confirmed that it would provide such studies at that time.

Finally, the Board is satisfied there would be no technical obstacle relating to the proposed design of the Reconstructed IPL that would prevent a new generator from interconnecting with CRT's Reconstructed Line. Considering the North American trends toward more open transmission access, the Board expects CRT to follow industry standards and practices in assessing any interconnection application which may be made in the future.

Chapter 3

Dismantling of the Existing Line

3.1 Safety During Dismantling

CRT proposed that its Existing Line would be dismantled once the Reconstructed Line is commissioned, so as not to interrupt its service. The Applicant has proposed that dismantling be scheduled for the winter of 2003/2004.

CRT described the dismantling process of the Existing IPL as requiring: the removal of conductors under physical tension; the rewinding of cables onto drums; the removal of insulators and hardware; the dismantling of towers, generally a panel at a time; the removal of tower foundations to a depth of one meter; the backfilling of foundation holes with suitable topsoil; and the immediate removal of recovered material. Existing access roads will be used to access the right-of-way and, if necessary, existing culverts will be reinforced by wood planks to support removal machinery.

CRT confirmed that the risk of PCB contamination was not an issue for this project as equipment associated with this risk will not be dismantled or removed. CRT also confirmed that the requirements of the existing laws, codes, and regulations applicable to construction sites will be respected during the dismantling, including the CSA Standard. CRT stated it would do all that it could in accordance with the governing regulations to ensure that all risks to the public would be avoided.

Views of the Board

The Board notes that the same security measures that were proposed for the construction of the Reconstructed Line will be taken during the dismantling of the Existing Line. The Board is satisfied that the measures proposed and CRT's assurances that it will follow the requirements of the existing laws, codes and regulations, including the CSA Standard as applicable, will protect the public. As the Board views the dismantling of the Existing Line as part of the construction program, conditions 12, 14, 17 and 18 are applicable (see Appendix 1).

Chapter 4

Land, Environmental and Socio-Economic Matters

4.1 Land Matters

CRT indicated that its right-of-way is 71 km long and 38.1 m wide, on average. CRT owns 95% of the right-of-way, the remaining 5% comprising easement (4%) and leased land (1%).

CRT indicated that the right-of-way is wide enough for the Reconstructed Line, with the exception of the Highway 20 crossing near the municipality of Coteau-du-Lac in Quebec. CRT further indicated that there is no extra temporary workspace required outside its right-of-way.

CRT has purchased the five properties it requires to widen the right-of-way where it crosses Highway 20.

CRT obtained approval from the Commission de protection du territoire agricole du Québec (CPTAQ) to subdivide, transfer and use for purposes other than agriculture the properties subject to the provisions of the *Act to preserve agricultural land and agricultural activities*.

Views of the Board

The Board notes that CRT acquired the five properties required for the Highway 20 crossing by mutual agreement and that there were no objections to the proposed general routing of the line. CRT also obtained the required authorization from the CPTAQ.

The Board finds the use of the existing right-of-way for the construction of the Reconstructed Line reasonable and justified.

4.2 Environmental and Socio-Economic Matters

As indicated in Section 1.3, the Board has prepared, in accordance with the CEAA and its own regulatory process, an Environmental Screening Report on CRT's application. The Report addresses the Early Public Notification process, line routing, environmental matters and socio-economic matters. The Report was also made available for comment.

Having reviewed the Environmental Screening Report and comments on the Report, in accordance with Hearing Order EH-1-2002 and the CEAA, the Board is of the opinion that, subject to implementation of the proposed mitigation measures and the measures listed as conditions in Appendix 1, the construction of CRT's Reconstructed Line and dismantling of the Existing Line are not likely to cause significant adverse environmental effects. This is the Board's ruling pursuant to paragraph 20(1)a) of the CEAA.

Public consultation, comments on the Report and the opinions of the Board have been included in the Environmental Screening Report (sections 6 and 7). A copy of the Report can be obtained from the Board.

Chapter 5

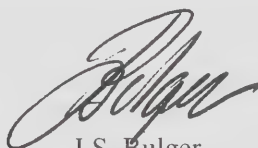
Disposition

The foregoing Chapters constitute our Reasons for Decision in respect of the application heard by the Board in the EH-1-2002 proceeding.


The Board is satisfied from the evidence that the proposed facilities consisting of the replacement of the Existing Line with the Reconstructed Line and the subsequent dismantling of the Existing Line are, and will be, required by the present and future public convenience and necessity, provided that the conditions outlined in Appendix 1 are met. The Board is also of the view that the construction, operation and dismantling of the facilities will be environmentally sound and safe for the public, if those same conditions are met.

Therefore, the Board will recommend to the Governor in Council that a Certificate of Public Convenience and Necessity be issued to CRT pursuant to Part III.1 of the Act, subject to the conditions outlined in Appendix 1.

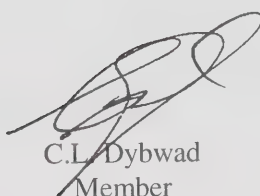
The Board confirms that the Certificate of Public Convenience and Necessity, if issued, will revoke the existing Certificate EC-10 but that revocation will only take effect upon the commissioning of the Reconstructed Line.



J.S. Bulger
Presiding Member



J.-P. Théorêt
Member



C.L. Dybwad
Member

Appendix I

Certificate Conditions

General

1. The international power line to be reconstructed and operated pursuant to this Certificate shall be owned and operated by CRT.
2. The Reconstructed Line shall be operated at 120 kV.
3. CRT shall cause the Reconstructed Line to be designed, manufactured, located, constructed, and installed in accordance with those specifications, drawings, and other information or undertakings set forth in its application and related correspondence.
4. CRT shall construct and operate the Reconstructed Line to comply with current Canadian Standards Association (CAN/CSA C22.3 No. 1-M87 Overhead Systems) and other relevant standards applicable to the construction and operation of power lines.
5. Regarding the possible use of the Reconstructed Line authorized under this Certificate to export electricity for a third party, CRT shall not provide transmission facilities to facilitate the export of electricity from Canada without first obtaining a copy of the exporters's permit or licence issued by the Board.
6. CRT shall not make any change to the Reconstructed Line authorized by this Certificate without prior approval by the Board.
7. CRT shall comply with all of the conditions contained in this certificate unless the Board otherwise directs.
8. CRT shall implement or cause to be implemented all of the policies, practices, recommendations and procedures for the protection of the environment included and referred to in its application and its undertakings made to other regulatory agencies as well as in any supplementary information and manuals of CRT.

Prior to Construction

9. CRT shall file with the Board for approval, no later than six (6) months prior to construction, a field manual describing all environmental protection procedures, mitigation measures, and monitoring commitments, as set out in CRT's application, subsequent filings, evidence collected during the hearing process, and through any regulatory requirements. This manual shall be developed in consultation with Environment Canada and Fisheries and Oceans Canada.

The environmental field manual shall address, but is not limited to, the following elements:

- a) environmental procedures, mitigation measures and monitoring applicable to all project phases, and activities;
 - b) rare species;
 - c) migratory birds and habitat;
 - d) monitoring of avian mortality, due to tower collisions, and any adaptive management;
 - e) work in proximity to watercourses, including any potential soil erosion, and sedimentation issues;
 - f) effects to fish habitat if applicable;
 - g) soil handling procedures;
 - h) vegetation management; and
 - i) waste and spill management.
10. CRT shall file with the Board for approval, no later than six (6) months prior to construction, a Wetland Protection Plan (WPP). In developing the WPP, CRT shall consult with Environment Canada and the Ontario Ministry of Natural Resources and provide the Board with a summary of their recommendations. The WPP shall apply to all wetlands, swamps, marshes, and fens, within CRT's right-of-way, with particular attention given to areas of special status, such as Summerstown Swamp. The WPP shall apply to all project phases, including but not limited to, vegetation clearing, construction, dismantling, operation and maintenance activities.
11. CRT shall file with the Board for approval, at least sixty (60) days prior to the commencement of construction activities:
- a) a report on its archaeological studies, including the methodology used, the results of surveys, and the proposed mitigation measures; and
 - b) copies of all correspondence from the provincial archaeological authorities regarding the acceptability of CRT's archaeological studies, including the methodology used, the results of surveys, and the proposed mitigation measures.
12. At least sixty (60) days prior to the commencement of construction, CRT shall submit for Board approval, a quality assurance and compliance program which will outline, in mandatory terms, the policies and procedures CRT will implement to ensure the Reconstructed Line is designed and constructed in conformance with the conditions of approval, company designs and specifications and undertakings set forth in its application or otherwise adduced in evidence before the Board in the EH-1-2002 proceeding. The program shall include but not be limited to:
- a) a process or procedure to identify all conditions of approval, company designs and specifications and undertakings set forth in its application or otherwise adduced in evidence that will be subject to this program;
 - b) the name of the person responsible for each aspect of the program;
 - c) the policies, processes and procedures that will be in place to achieve the desired end result (quality and compliance);
 - d) the person(s) authorized to stop work when it is in non-conformance with the conditions of approval, designs, specifications and undertakings;

- e) the qualifications of the person(s) authorized to stop work;
 - f) process or procedure to identify and implement corrective action before recommencing work; and
 - g) methods by which adherence to the policies, processes and procedures will be monitored, measured, documented and reported to management.
13. CRT shall file with the Board for approval, at least sixty (60) days prior to the commencement of construction activities:
- a) a report on its studies on the potential impacts of construction and operation on CN, including the methodology used, the results of the studies, and the proposed mitigation measures; and
 - b) copies of all correspondence from CN regarding the acceptability of CRT's studies, including the methodology used, the results of the studies, and the proposed mitigation measures.
14. CRT shall file with the Board, at least sixty (60) days prior to the commencement of construction activities:
- a) the contractor's construction manual;
 - b) the contractor's health and safety program;
 - c) CRT's acceptance of the contractor's construction manual and health and safety program;
 - d) the contractor's training program on guidelines and standards in effect;
- and as soon as available:
- e) the final emergency response plan as agreed to by CRT in its agreement with the contractor.
15. At least sixty (60) days prior to construction, CRT shall file with the Board for approval, a restoration plan for CRT's right-of-way. The restoration plan shall address all measures to be taken to restore CRT's right-of-way to a condition similar to that prior to any project work and activities.

Prior to Operation

16. At least sixty (60) days prior to operation of the Reconstructed Line, CRT shall submit for Board approval, its Operations and Maintenance Manual.
17. CRT shall provide the Board, at least sixty (60) days prior to operation of the Reconstructed Line, the following information:
- a) the identity of all utilities that are being crossed by the Reconstructed Line; and
 - b) crossing permits or agreements for those utilities that are being crossed.

During Operation

18. Within 30 days of the date that the Reconstructed Line is placed in service, and within 30 days of the date that dismantling of the Existing Line is complete, CRT shall file with the Board a confirmation, by an officer of the company, that the approved facilities were constructed and dismantled in compliance with all applicable conditions.
19. Certificate EC-10 will be revoked upon the commissioning of the Reconstructed Line.

